

IN THE US PATENT AND TRADEMARK OFFICE

Inventor:

BEHAGEN et al.

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For: A DEVICE FOR REMOTE
CONTROL OF A COMPUTER
BY RADIO

Examiner: C. Grant



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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313

SECOND AFFIDAVIT UNDER 37 CFR 1.132

I, Nitzan Rabinowitz, am the Chief Technological Officer of Moonlight Cordless Ltd. at Ramat Gan, Israel. I have a first degree in mathematics, which I received from Ben-Gurion University, Israel, and a Ph.D in seismology, which I received from Uppsala University, Sweden. My professional specialization is in the field of applied mathematical models. I previously attached a copy of my curriculum vitae with some of the most recent publications to an earlier affidavit for the present application.

I am an expert consulting Moonlight Cordless Ltd. with regard to the present invention. We have read the present application and the new and amended claims, as well as the Office Action from the Examiner and the accompanying references. In support of the accompanying Response to this Office Action, I have provided additional details concerning the operation of the present invention.

Briefly, the present invention relates to a computer that is divided into two separate, distinct and physically detachable components: a remote input platform and computer monitor on the one hand, and a main computer on the other. The remote input platform and the computer monitor may or may not be detached, but these components are separable and detachable from the main computer. As recited in the new and amended claims, and as described in the specification, the present invention seeks to control the components of a computer, not by converging a computer and another consumer electronic appliance, but instead by dividing a single computer into two dependent, interlocking platforms, which only when combined together form a fully functional single computer. The main computer is therefore remote from the computer monitor, such that the main computer and the computer monitor communicate through a wireless medium. The computer monitor of the present invention is not a television, and is therefore not automatically capable of displaying television programs, as an inherent property of the device.

The present invention represents a significant, non-obvious, inventive advance over the background art such as Van Ryzin (US Patent No. 6,131,130), for example, as Van Ryzin teaches a system which is intended to *converge* the personal computer with wireless home consumer electronics audio/video devices, as indicated by the title, "System for Convergence of a Personal Computer with Wireless Audio/Video Devices...". Van Ryzin's system is clearly designed to permit the user to operate the A/V (audio/video) devices like TV and DVD from anywhere in the home by allowing the user to control such A/V devices through the personal computer, by giving commands from peripheral devices to the personal computer, which then controls the A/V devices according to the commands.

In Van Ryzin's invention, the personal computer is clearly shown as being connected to a video monitor that is acting as a television, in that it is described as being capable of displaying television programs. A television would actually require further adaptation in order to be able to act as the monitor for the personal computer, because computer monitors

and televisions have different requirements in terms of the signal received and the processing of that signal. However, no further computer monitor is described, which indicates that Van Ryzin's system is intended to use a television in place of the computer monitor.

On the other hand, Moonlight's invention seeks to control the components of a computer, not by converging a computer and another consumer electronic appliance, but instead by dividing a single computer into two dependent, interlocking platforms, which only when combined together form a fully functional single computer. The computer is therefore remote from the computer monitor, such that the computer and the computer monitor communicate through a wireless medium. The computer monitor of the present invention is not a television, and is therefore not automatically capable of displaying television programs, as an inherent property of the device. The video data that is sent to the computer monitor is compressed, which is essential to the function of the monitor in the present invention. Van Ryzin does not discuss such functionality.

Phan (US Patent No. 6,064,437) does not cure the deficiencies of Van Ryzin, because Phan also teaches the importance of the convergence of home computers with audio/video devices, particularly with a television set. Phan seeks to accomplish such convergence through converting video data stored in a format suitable for a computer monitor (such as RGB) to a format that is suitable for a television set (such as NTSC compatible, interlaced video information); see for example col 4, lines 4-16. Indeed as Phan states in col 1, lines 47-49, "what is needed is a scheme for preprocessing the video information prior to presentation on the television screen". Thus, Phan is completely compatible with Van Ryzin, since both teach that computers should send video information to television sets, as part of "convergence" with home entertainment appliances; however, neither teaches that a computer monitor should be separate from the main part of the computer, as this configuration would not support the goal of convergence.

By contrast, the present invention fulfills a long felt need for computers that have been divided into dependent, interlocking pieces. At the time of filing of the application, no such idea existed. It would be very useful to be able to remotely interact with different parts of a single computer.

Moonlight's wireless PC solution is pre-designed to allow the detachment of the PC-monitor from the PC. Moonlight's solution is unlike other wireless image transmission strategies, which are concerned with PC to TV solutions, that involve down scaling and degrading of the picture quality.

In the course of the development of this new technology, I realized that achieving the goal of transmitting good quality video is heavily dependent upon overcoming a few technological barriers, which have to do with the quality and performance capabilities of the compression methods used. This is especially true when external constraints, such as network constraints, require low bit rate video, to be transmitted at relatively low bit-rate.

Early experiments with standard video compression methods of the MPEG-2 standard, even those based on the "gold benchmark" of the TM5 (test model 5) and its various derivatives, of highly exhaustive direct search – full search algorithms, indicated that these methods may pose severe limitations on the ability to transmit good or even moderate quality of all the computer-generated, computer accelerated, and traditional video contents. There are several reasons for these limitations:

1. The known methods of encoding MPEG (1/2/4...) are practically indifferent to the content of the video streams they are encoding. This property is reflected in their rate control procedure, whose bit allocation management is carried out by allocating rather stiff ratios between the sizes (in bits) of the I, B, and P frames. They do not allow the ability to alter the frames-size ratios significantly and use fixed frames-size ratios all over the stream, irrespective of the frames content. In many cases, such a scheme implies excessive bit allocation. Consider for example a situation in which the stream

content is rapidly changing from motion picture to plain text. Naturally, the size of the B and P frames should be significantly reduced; however, in practice the size-allocation is almost independent of the frame content, and the size reduction in the B or P frame is rather limited, resulting in an insufficient allocation of bits to the I frame, which needs far higher allocation of bits in extreme situations (for example when a highly detailed Excel Data Base Desktop is encoded.)

2. The various Direct Search based motion estimation methods currently in use (e.g. Hierarchical search, 4ss search, gradient search, diamond search, etc.), apart from their high computational consumption, suffer from inherent drawbacks, such as the failure of the search procedures to take into account spatial correlation between an individual matched macro block and its neighboring macro blocks.

To achieve its wireless PC vision, while using inter-intra encoding of the PC's Desktop, Moonlight had to overcome the technological barriers that the industry perceived as technologically blocking bottlenecks that do not allow a practical implementation of such a concept.

Moonlight decided to pursue the development of a new "content based" compression technology, and Moonlight overcame these technologically blocking bottlenecks and succeeded in achieving the above-mentioned objectives. The original concept could not have been envisioned by others, since at that time Moonlight applied for the patent, the conventional wisdom of video compression companies was that there was no way of transferring high resolution, low bit rate, variable content video over inter-intra compression methods.

The best demonstration of the failure of the industry to envision this implementation, is displayed by Microsoft's "Smart Display". This latest Microsoft innovation tries to do

what Moonlight designed in a different way, through network protocols. Since this concept cannot relate to the CODEC capabilities that Moonlight has developed, the "Smart Display" does not overcome the technologically blocking bottlenecks and thus results in no motion video capabilities.

In closing, the above-mentioned improvements have yielded an extremely efficient compression procedure which has paved the way for the eventual realization of the Wireless PC.

Moonlight's method can download data files such as MPEG-2 clips onto our cordless PC desktop, at a rate of 2-3Mb/s for a SVGA SCREEN, a rate which is not possible without the use of compression, and would certainly not be possible according to the teachings of Van Ryzin or Phan, alone or in combination.

I hereby certify that the above facts and statements are true and complete, to the best of my knowledge.



Nitzan RabinowitzDate: 7-9-03